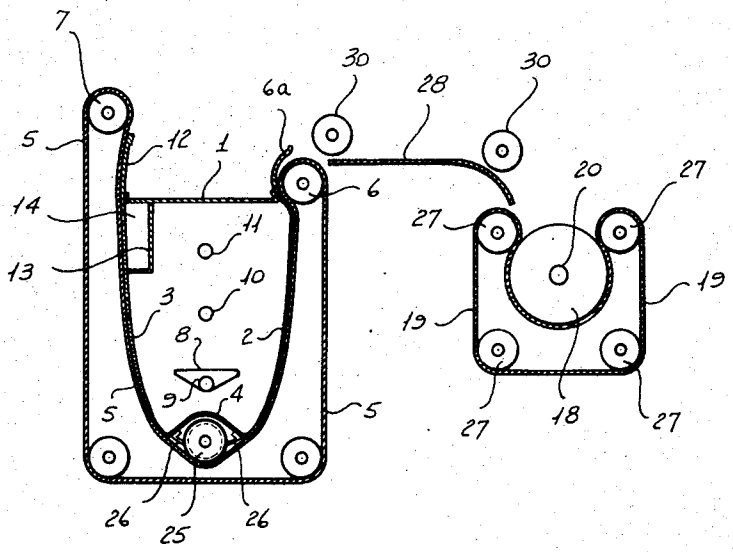
Aug. 7, 1951 L. VEYRET ET AL 2,563,666

MACHINE FOR DEVELOPING HELIOGRAPHIC PAPERS

Filed Jan. 19, 1950

Fig 1



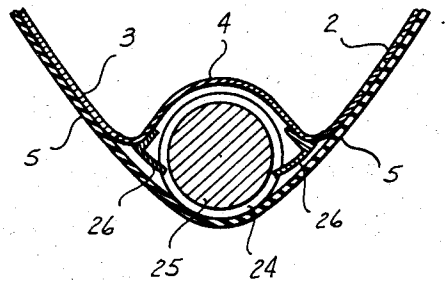


Fig 2

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MACHINE FOR DEVELOPING HELIOGRAPHIC PAPERS

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4 Claims. (Cl. 95—94)

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This invention relates to a machine for developing heliographic papers and has for an object to provide a machine of the above type having novel and improved features of construction.

Another object is to provide a machine of the above type in which the paper is introduced and delivered at the same end of the housing.

Other objects will be apparent as the nature of the invention is more fully disclosed.

Heliographic papers whose sensitive layer is formed by a mixture of a light-sensitive diazo compound with a phenol yielding an azo dye under the action of ammonia gas are commonly developed in an apparatus consisting essentially of a hollow perforated box in which hot ammoniacal vapors are generated and over the perforated side of which the papers are fed by an endless belt.

The disadvantages of these devices are their bulk and the fact that the paper emerges at some distance from the point of insertion, which involves a certain amount of inconvenience for the operator, particularly when the machine is to be operated at high capacity.

The present invention overcomes these disadvantages, and, without increasing the volume of such devices, it doubles their output and makes it possible to turn out developed paper at high speed near the point of insertion, an advantage satisfying a widespread demand among users.

The present invention provides a box perforated on two sides, over which the feed belt passes, thus doubling the length of contact of the paper to be developed with the internal atmosphere of the box, and doubling the rate of developing for a given length of apparatus.

The box is so shaped at the base as to provide a bearing for a return roller, idling or driven, over which the endless belt is passed in order to reduce the frictional forces to which it would be subject if passed directly from one perforated side to the other over a transition surface fixed with respect to the two sides.

The invention will be better understood from the following description, taken in connection with the accompanying drawing, in which a specific embodiment has been set forth for purposes of illustration.

In the drawing:

Fig. 1 is a vertical section through a printing and developing machine embodying the invention; and

Fig. 2 is an enlarged detail view of the feed roller at the bottom of the developing machine.

Referring to the drawings, the invention is

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shown as embodied in a box having a closed top 1 and perforated sides 2 and 3 which taper inwardly toward the bottom to provide a smoothly curved surface over which the paper can be fed for developing. The bottom 4 of the box is indented upwardly to provide space to receive a feed roller 25. An endless belt 5 of rubber or other waterproof material passes over feed rollers 6 and 7 and the bottom roller 25. The paper enters between shield 6a and the roller 6, follows the two sides 2 and 3 of the box, and leaves at the roller 7, after passing the guide plate 12.

The ammoniacal solution is introduced dropwise into a heated pan 8, with electrical heating resistance 9, to evaporate the liquid. Electrical heating resistances 10 and 11 are adapted to bring the gaseous internal atmosphere to the optimum developing temperature. It is desirable at the same time to deodorize the developed paper by heating, for example, the outlet guide plate 12. Such a deodorization could also be effected by adding a tight partition as shown at 13 in the compartment 14 formed by the partition 13. A current of fresh air is circulated to deodorize the paper when it passes the perforations in the wall 3 at the compartment 14. It is obviously possible to combine both methods of deodorization.

In order to prevent the paper from passing between the roller 25 and the bottom 4 of the box, the roller 25 is provided with annular grooves 24 in which stripping and guide fingers 26 ride. The guide fingers 26 are attached to the two sides 2 and 3 of the box and form continuations of the surfaces thereof for guiding the paper around the bottom of the box as it is fed by the belt 5.

In the apparatus shown the belt is advanced by simply driving the inlet guide roller 6 or outlet guide roller 7 or both. The latter arrangement may be further improved by turning the roller 7 at a slightly lower peripheral speed than the roller 6, thereby reducing the let-off tension of the belt and avoiding stretching of the paper or unevenness in feed.

An apparatus of the type described may be combined with a printer in such a way as to effect the two operations of printing and developing continuously and without interruption.

A printer combined with the developing machine has been shown in Fig. 1 as including a glass cylinder 18, driven by an endless belt 19. A lamp 20 is situated in the cylinder 18. The paper introduced at 21 is fed around the cylinder 18 by the belt 19 passing over rollers 27 and passing over the guide 28 to the developing machine, pre-

senting its sensitive side to the perforated box, the most advantageous arrangement for rapid developing. Feed rolls 30 may be used to feed the paper along the guide 28.

What is claimed is:

1. A machine for developing heliographic paper comprising a closed box having solid top and end walls and perforated side walls tapering toward the bottom in a smooth curve for the feeding of sheets to be developed over the outer surface of the box, an ammonia liquid receiver in said box, heating means to vaporize said liquid and form an atmosphere of ammonia vapor in said box, a bottom wall joining said side walls having a recess to receive a guide roller, said roller being so positioned that its under surface is a substantial continuation of the surfaces of said side walls, feed rollers at the upper end of each of said side walls, an impervious endless belt passing around all of said rollers and contacting said perforate side walls to form a closure therefor and arranged to feed sheets to be developed over both of said side walls, said bottom roller having a series of annular grooves therein and stripping and guide fingers attached to the lower ends of said side walls and riding in said grooves to guide the paper around the roller in passing between said side walls.

2. A developing machine, as set forth in claim 1, in which the side wall on the exit side with respect to the paper feed is provided with a heated vertical shield extending upward from the top of said box along the path of said belt for stripping gases from said paper before discharge.

3. In a developing machine, as set forth in claim 1, a separate compartment formed adjacent the top of one of the side walls on the exit side of the machine with respect to the paper feed, said compartment communicating with the perforations at the exit end of said side wall and having suction means to draw outside air through said perforations for removing gases from said paper before discharge.

4. A developing machine, as set forth in claim 1, in which the top roller at the exit side in the direction of the paper feed is rotated more slowly than the top roller at the entrance side so as to reduce the tension on the portion of the belt which feeds the paper around said side walls.

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